DOCUMENT RESUME

ED 341 811 CE 060 293

AUTHOR Rogers, George E.
TITLE A Reassessment of the Adoption of Technology Education by Industrial Arts Teachers.
PUB DATE Dec 91
NOTE 33p.; Paper presented at the American Vocational Association Convention (Los Angeles, CA, December 1991).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Adoption (Ideas); Attitude Change; *Educational Innovation; Followup Studies; Industrial Arts; *Industrial Arts Teachers; *Resistance to Change; Secondary Education; *Teacher Attitudes; *Technology
IDENTIFIERS Nebraska; Stages of Concern Questionnaire; *Technology Education

ABSTRACT

A follow-up was done of an earlier study that found that industrial arts teachers had failed to accept technology education as a replacement for industrial arts. A reassessment of Rogers' (1989) Stages of Concern (SoC) research was conducted. All industrial educators from both the Omaha (Nebraska) and Millard (Nebraska) Public Schools were included in the sample group. The SoC questionnaire was used to measure teachers' attitudes toward technology education. The 35 items on the questionnaire represented the 7 stages of concern, with 5 items used for each step. Forty-two of 59 teachers responded, with 2 returned surveys unusable. Analysis of the SoC profile indicated that the total sample's relative peak was located at the information stage, with a secondary peak at the refocusing stage. Relative peaks in either of these SoC stages indicated nonadoption of the educational innovation. Data showed that 31 respondents had peaks below the management stage. This lack of SoC profile peaks in the latter four stages meant that the majority of industrial education teachers had not adopted technology education. Data clearly indicated that older (51 years old or more) and more experienced (26 years teaching or more) industrial arts teachers were refocusing technology education prior to its adoption. This revising meant that they felt the new program did not meet students' educational needs. (Eight tables and seven figures are attached.) (YLB)

**********
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
**********

ED341811

# A REASSESSMENT OF THE ADOPTION OF TECHNOLOGY EDUCATION BY INDUSTRIAL ARTS TEACHERS

---

A Research Paper

Presented At

The American Vocational Association

1991 Convention

---

by

DR. GEORGE E. ROGERS

Idaho State University

CE 060 253

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☐ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

G E Rogers

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."



BEST COPY AVAILABLE

According to Wright (1990) "technology education is making a strong bid to replace traditional skill-focused industrial arts classes in the curriculum in many schools across the country" (p. 25). But, studies by Smallwood (1989) and Rogers (1989) both indicated that industrial arts teachers have failed to accept this educational innovation. Have these industrial arts teachers, who previously resisted the shift from traditional skill-focused classes to technology education, now accepted this new curriculum? In order to ascertain the answer to this question, a follow-up of Rogers (1989) Stages of Concern research was conducted.

## Literature Review

The first research located on the adoption of technology education by industrial arts teachers was by Swanson (1984). In this study, 150 Minnesota industrial arts teachers were asked to classify their programs as technology education, contemporary industrial arts, or traditional industrial arts. The results indicated only five programs (3.3%) were classified as technology education and the vast majority 110 programs (73.3%) were classified as traditional industrial arts.

Rogers (1989) examined the adoption of technology

education by industrial arts teachers in Omaha, Nebraska. These industrial arts teachers' attitudes were assessed utilizing Hall's Stages of Concern (SoC) in February 1988. (Hall's SoC is explained later in this article) At that time, none of the study's respondents indicated adoption of the technology education curriculum.

Smallwood (1989) examined the attitudes of Indiana industrial arts teachers toward technology education. Smallwood noted that junior high/middle school teachers had a more favorable attitude toward technology education than high school teachers. The study indicated no difference in the acceptance of technology education between school settings, such as urban, rural, or suburban and also there was no difference in acceptance with regard to the professional involvement of industrial arts teachers.

Smallwood's study concluded that "many variables influence an individuals attitude toward change. Variables such as age, years of teaching experience, and philosophy help shape attitude" (p. 34). The basic outcome of Smallwood's research was the "Indiana industrial arts teachers have mixed reactions regarding technology education" (p. 35). This lack of a clear

indication of technology education acceptance (or rejection) by Indiana's teachers suggests the need for further research in this area.

## Method

The Stages of Concern (SoC) model mentioned earlier "describes the feelings, perspectives, and attitude of individuals as they consider, approach, and implement use of an innovation" (Hall, 1979, p. 205). An individual must pass through the seven stages in the SoC model. These seven stages can be seen on Table 1.

The concepts of the SoC and Concerns Based Adoption Model (CBAM) research are built upon a positive assumption about change facilitation. One of the strengths of the CBAM is that it is virtually impossible to manipulate a person's concerns (Hall, 1979, p. 208).

### Subjects

In order to obtain the largest local sample available, all industrial educators from both the Omaha (Nebraska) Public Schools and the Millard (Nebraska) Public Schools were included in the sample group. The Omaha Public School (OPS) District is a large urban

Table 1

Stages of Concern about the Innovation

REFOCUSING: The focus on exploration of more universal benefits from the innovation. Individual has definite ideas about alternatives to the innovation.

COLLABORATION: The focus is on ccordination and cooperation with others regarding use of the innovation.

CONSEQUENCE: Attention focuses on impact of the innovation on students in the individual's sphere of influence.

MANAGEMENT:Attention is focused on the processes and tasks of using the innovation and best use of resources.

PERSONAL: Individual is uncertain about the demands of the innovation and the role of the innovation.

INFORMATION: A general awareness of the innovation and interest in learning more about it.

AWARENESS: Little concern about the innovation is indicated.

school district with 48,700 students. The OPS industrial education department had changed its name and focus to technology education in 1987. The Millard Public School (MPS) District is a suburban district of 16,700 students. The MPS industrial education department could be described as contemporary industrial education.

Instrument

The stages of Concern Questionnaire (SoCQ) (Hall & Rutherford, 1976) was used to measure the teachers' attitudes toward technology education. The SoCQ evolved from Hall's CBAM, which hypothesizes that individuals progress through the seven different stages of concern as they accept an innovation (see Table 1). The 35 items on the questionnaire represent the seven stages of concern, with five items utilized for each stage.

The completed questionnaires were scored using the Stages of Concern Questionnaire Scoring Device (Hall, 1979). According to Hall and Rutherford (1976), the SoCQ is a valid measure of the studied concern.

Procedure

The SoCQ was mailed in May of 1990 to the 44

industrial arts teachers listed in the 1989 OPS Personal Directory. The SoCQ was also mailed to the 15 MPS industrial arts teachers. The response rate was 71.2% (42 of 59), with two returned surveys unusable because of incomplete responses. The response rate for OPS was 75.0%, with 76.5% for junior high/middle school teachers and 74.1% for senior high school teachers. While MPS teachers' response rate was lower at 60.0%.

These 40 individual SoCQs were calculated utilizing the Stages of Concern Questionnaire Scoring Device (Hall, 1979). Raw scores were first tabulated, calculated to percents, and graphed individually, then grouped by school districts, school setting, teacher experience level, and teacher age for further analysis.

## Findings

Analysis of the SoC profile, Figure 1, indicated the total sample's relative peak was located at the information stage, with a secondary peak at the personal stage. Relative peaks in either of these SoC stages indicate non-adoption of the educational innovation.

The data indicated that 31 of the respondents (77.5%) had peaks below the management stage (see Table 2). This lack of SoC profile peaks in the latter four

stages (management, consequence, collaboration, and refocusing) indicated the majority of industrial education teachers had not adopted technology education (Rutherford, Hall, & Huling, 1983).

In comparing the SoC profiles of OPS industrial arts teachers to MPS industrial arts teachers, Figure 2 and Table 3, it can be noted that both districts' teachers had SOC peaks in the information stage. Plus, the majority of industrial arts teachers of both school districts had relative SoC peaks at the information stage. Individuals whose SoC profiles peak in this stage have only a general awareness of the innovation. Eight OPS teachers (25.8%) did, however, show relative peaks in either the management of collaboration stages, thus indicating their acceptance of technology education. This should be expected, as OPS has attempted to diffuse technology education for over three years. However, even though 25.8% of the OPS teachers

indicated adoption of technology education, the majority 74.2%, had not accepted this new curriculum.

Figure 3 indicated that the SoC profiles of junior high/middle school teachers had a relative peak at the personal stage, while senior high school teachers had a relative peak at the information stage. Again, both of these SoC profiles indicated a general non-acceptance of technology education. Table 4 showed that seven senior high school teachers' SoC profiles (30.4%) did indicate adoption, while only two of the junior high/middle school industrial arts teachers (11.8%) had relative peaks at or above the management stage.

The findings of Table 4 also indicated another interesting occurrence. Two senior high teachers (8.7%) indicated a relative SOC peak in the collaboration stage. Thus, the SOC profiles indicated that these two individuals have adopted technology education and are focused on coordination of its use with other teachers.

Figure 4 and Table 5 show the SoC profiles with the sample divided into both school district and school type. These four profiles indicated the same adoption level as Figures 2 and 3. However, two sections of the graph deserve further attention. First, it is the OPS senior high teachers who have the secondary peak at the

collaboration stage. Secondly, the SoC profiles of OPS junior high/middle school industrial arts teachers show a secondary peak at the refocusing stage. These junior high/middle school industrial arts teachers, the individuals OPS had developed its technology education curriculum for, are revising and refocusing this new curriculum before they have accepted the curriculum.

The SoC graph, Figure 5 and Table 6, which divided the respondents' profiles by age group, indicated three distinct phenomenon. First, only the middle age group, 41 to 50 years old, indicated any acceptance of technology education. Five of the 21 respondents (23.8%) of this age group had relative peaks in the management stage and two individuals (9.5%) had relative peaks in the collaboration stage.

This middle age group also had a secondary peak at the collaboration stage. The data showed that 33.3% of the middle age group had adopted technology education. However, 66.7% of this age group had not adopted the new curriculum.

The second phenomenon that Figure 5 and Table 6 indicated was that only two of the younger age group, 20 to 30 year old teachers, as well as none of the older teachers, 50 or more years old, had accepted technology

education. According to Smallwood (1989), younger teachers are more likely to accept this educational innovation than older teachers. However, this study does not support that claim.

Thirdly, a secondary peak in the refocusing stage indicated that the older industrial arts teachers are revising technology education before they have accepted the innovation. This phenomenon was also indicated in Figure 4 and Table 5 with regard to the junior high/middle school industrial arts teachers from OPS.

Figure 6 and Table 7 showed the SOC profiles of the industrial arts teachers divided by years of teaching experience. The SoC profiles of teachers with 26 or more years of experience indicated a secondary peak in the refocusing stage, just as the older teachers' SoC profiles had also shown. Again, the older and more experienced industrial arts teachers have some definite ideas about educational alternatives to the proposed new curriculum.

Figure 7 and Table 8 compare the SoC profiles from Rogers (1989) research to this current research. The sample from 1988 included 15 industrial arts teachers, while the sample in this research include 40 industrial arts teachers. Figure 7 indicated that these two SoC

profiles were very similar. Although no statistical analysis was performed, it can be seen that no progress toward the upper SoC stages was made. Except for the 11.3% rise in the refocusing stage, only a small movement was noted between the profiles. The rise in the refocusing stage, again, indicated that the industrial arts teachers are revising technology education before they have adopted it.

The data from this research clearly indicated that the majority of industrial arts teachers have failed to accept or adopt technology education. The data also clearly indicated that older (51 years old or more) and more experienced (26 years teaching or more) industrial arts teachers are refocusing technology education prior to its adoption.

Possible explanation for this lack of adoption could be:

1. Technology education advocates have failed to show any relative advantage of the curriculum to the teachers asked to implement the change (Rogers, 1989).

2. The technology education curriculum was externally developed. Teachers are more likely to accept an innovation they were involved in developing (Rutherford, Hall, & Huling, 1983).

3. Technology education change agents ignored the feelings of industrial arts teachers by failing to provide adequate in-service training on the adoption of the new curriculum (Rutherford, Hall, & Huling, 1983).

4. The previous change experience of the industrial arts teachers may not have been positive (Rutherford, Hall, & Huling, 1983).

5. The technology education programs may not have been suited to the schools' needs (Loucks & Melle, 1980).

6. The technology education proponents may not have invested enough time nor enough funds in the diffusion of their innovation (Loucks & Melle, 1980).

## Discussion

Non-adoption of technology education by industrial arts teachers is clearly indicated by the results of this study, just as indicated in research by Swanson (1984) and Smallwood (1989). The lack of upward movement in the SOC profiles from Rogers (1989) research to the current research showed that there has not been a shift in the acceptance level of technology education by the industrial arts teachers.

Compared to the research by Rogers (1989), the increase of the respondent's SoC profiles at the refocusing stage indicated that the older, more experienced, industrial arts teachers are revising or altering the technology education curriculum prior to its adoption. This revising of the proposed technology education curriculum indicated that the industrial arts teachers feel that the new program does not meet the educational needs of their students.

The results of this study suggest that the OPS departmental name change, from industrial education to technology education, may have been premature. As pointed out by LaPorte (1986), "without a change in practice before a name change at the local level, the new name may be viewed simply as an opportunistic move" (p. 71).

The findings of this study add further credence to Swanson's (1984) analysis of industrial arts teachers' feelings toward technology education, as also quoted in Rogers (1989), "the plain truth of the matter is that the profession is not buying technology education" (p. 2).

REFERENCES

Hall, G.E. (1979). The concerns-based approach to facilitating change. Educational Horizons, 57(4), 202-208.

Hall, G. E. & Rutherford, W. L. (1976). Measuring stages of concern about the innovation: A manual for use of the stages of concern questionnaire. Austin, TX: Research and Development Center for Teacher Education, The University of Texas.

LaPorte, J.E. (1986). Challenges in the new name. Journal of Industrial Teacher Education, 23(2), 71-72.

Loucks, S. & Melle, M. (1980). Implementation of a district wide science curriculum: The effects of a three year effort. In Hall, G. E. Making change happen: A case study of school district implementation. Boston, MA. (ERIC Documentation

Reproduction Service No. ED 250 162)

Rogers, G.E. (1989). Reactions to implementing technology education. School Shop, 48(6), 38-39.

Rutherford, W.L., Hall, G.E., & Huling, L.L. (1983). Implementing instructional change: The concerns-based perspective. Teacher Inquiry: A Strategy for Improving Secondary Basic Skills Instruction, January, 129-146.

Smallwood, J.E. (1989). How Indiana educators feel about their new curriculum. School Shop/Tech Directions, 49(5), 34-35.

Swanson, R.A. (1984). Hold the press! The Technology Teacher, 43(6), 2.

Wright, T. (1990). Changes in curriculum, students, and educator's role call for new competencies. School Shop/Tech Directions, 50(1), 25-27.

Table 2

SOC Profiles of the Total Sample

| SOC Level | n | % | Profile |
|---|---|---|---|
| Awareness | 5 | 12.5 | 74.2 |
| Information | 18 | 45.0 | 85.2 |
| Personal | 8 | 20.0 | 84.1 |
| Management | 7 | 17.5 | 67.9 |
| Consequence | 0 | 0.0 | 55.6 |
| Collaboration | 2 | 5.0 | 67.9 |
| Refocusing | 0 | 0.0 | 65.3 |

Table 3

SOC Profiles of Omaha Public School (OPS) Industrial Arts Teachers and Millard Public School (MPS) Industrial Arts Teachers

| | OPS | | | MPS | | |
|---|---|---|---|---|---|---|
| SOC Level | n | % | Profile | n | % | Profile |
| Awareness | 5 | 16.1 | 75.4 | 0 | 0.0 | 70.1 |
| Information | 12 | 38.7 | 84.5 | 6 | 66.7 | 87.4 |
| Personal | 6 | 19.4 | 83.7 | 2 | 22.2 | 85.0 |
| Management | 6 | 19.4 | 55.5 | 1 | 11.1 | 72.8 |
| Consequence | 0 | 0.0 | 54.9 | 0 | 0.0 | 58.1 |
| Collaboration | 2 | 6.5 | 68.6 | 0 | 0.0 | 65.7 |
| Refocusing | 0 | 0.0 | 67.2 | 0 | 0.0 | 58.9 |

Table 4

SOC Profiles of Junior High/Middle School (JHS/MS) Industrial Arts Teachers and Senior High School (SHS) Industrial Arts Teachers

| | JHS/MS | | | SHS | | |
|---|---|---|---|---|---|---|
| SOC Level | n | % | Profile | n | % | Profile |
| Awareness | 2 | 11.8 | 74.7 | 3 | 13.0 | 73.8 |
| Information | 8 | 47.1 | 87.4 | 10 | 43.5 | 83.6 |
| Personal | 5 | 29.4 | 87.7 | 3 | 13.0 | 81.4 |
| Management | 2 | 11.7 | 73.5 | 5 | 21.7 | 63.3 |
| Consequence | 0 | 00.0 | 57.5 | 0 | 00.0 | 54.2 |
| Collaboration | 0 | 00.0 | 65.1 | 2 | 08.7 | 70.1 |
| Refocusing | 0 | 00.0 | 63.4 | 0 | 00.0 | 66.7 |

Table 5

SOC Profiles of Both OPS and MPS Junior High/Middle School Teachers and Senior High School Teachers

| OPS | | JHS/MS | | | SHS | |
|---|---|---|---|---|---|---|
| SOC Level | n | % | Profile | n | % | Profile |
| Awareness | 2 | 16.7 | 76.8 | 3 | 15.8 | 74.5 |
| Information | 4 | 33.3 | 87.8 | 8 | 42.1 | 82.4 |
| Personal | 4 | 33.3 | 90.0 | 2 | 10.5 | 79.8 |
| Management | 2 | 16.7 | 77.0 | 4 | 21.0 | 69.8 |
| Consequence | 0 | 0.0 | 59.8 | 0 | 0.0 | 51.8 |
| Collaboration | 0 | 0.0 | 66.9 | 2 | 10.5 | 69.7 |
| Refocusing | 0 | 0.0 | 68.8 | 0 | 0.0 | 66.1 |

Table 5 (continued)

| MPS | JHS/MS | | | SHS | | |
|---|---|---|---|---|---|---|
| Awareness | 0 | 0.0 | 69.8 | 0 | 0.0 | 70.5 |
| Information | 4 | 80.0 | 86.2 | 2 | 50.0 | 89.0 |
| Personal | 1 | 20.0 | 82.2 | 1 | 25.0 | 88.5 |
| Management | 0 | 0.0 | 64.6 | 1 | 25.0 | 83.0 |
| Consequence | 0 | 0.0 | 52.0 | 0 | 0.0 | 65.8 |
| Collaboration | 0 | 0.0 | 60.6 | 0 | 0.0 | 72.0 |
| Refocusing | 0 | 0.0 | 50.2 | 0 | 0.0 | 69.8 |

Table 6

SOC Profiles of Industrial arts Teachers by Age Groups

| | 20-40 | | | 41- 50 | | | 51 plus | |
|---|---|---|---|---|---|---|---|---|
| SOC Level | n | % | Profile | n | % | Profile | n | % | Profile |
| Awareness | 0 | 0.0 | 72.8 | 1 | 4.8 | 70.2 | 4 | 44.4 | 84.9 |
| Information | 5 | 50.0 | 89.3 | 9 | 42.9 | 81.3 | 4 | 44.4 | 81.9 |
| Personal | 3 | 30.0 | 89.6 | 4 | 19.0 | 82.6 | 1 | 11.1 | 81.3 |
| Management | 2 | 20.0 | 74.5 | 5 | 23.8 | 68.4 | 0 | 0.0 | 68.4 |
| Consequence | 0 | 0.0 | 66.9 | 0 | 0.0 | 58.2 | 0 | 0.0 | 45.9 |
| Collaboration | 0 | 0.0 | 71.1 | 2 | 9.5 | 74.2 | 0 | 0.0 | 44.2 |
| Refocusing | 0 | 0.0 | 68.5 | 0 | 0.0 | 63.9 | 0 | 0.0 | 65.1 |

Table 7

SOC Profiles by Years of Teaching Experience

| | 0-10 | | | 11-15 | | | 16-20 | | |
|---|---|---|---|---|---|---|---|---|---|
| SOC Level | n | % | Profile | n | % | Profile | n | % | Profile |
| Awareness | 0 | 0.0 | 84.8 | 0 | 0.0 | 56.8 | 1 | 7.1 | 75.5 |
| Information | 3 | 75.0 | 93.3 | 1 | 20.0 | 81.2 | 6 | 42.9 | 86.9 |
| Personal | 0 | 0.0 | 90.3 | 4 | 80.0 | 87.4 | 3 | 21.4 | 89.3 |
| Management | 1 | 25.0 | 68.3 | 0 | 0.0 | 59.0 | 4 | 28.6 | 73.9 |
| Consequence | 0 | 0.0 | 66.8 | 0 | 0.0 | 59.4 | 0 | 0.0 | 65.0 |
| Collaboration | 0 | 0.0 | 72.8 | 0 | 0.0 | 69.4 | 0 | 0.0 | 72.4 |
| Refocusing | 0 | 0.0 | 69.5 | 0 | 0.0 | 56.6 | 0 | 0.0 | 70.1 |

Table 7 (continued)

| | 21-25 | | | 26 plus | | |
|---|---|---|---|---|---|---|
| Awareness | 1 | 16.7 | 68.8 | 3 | 30.0 | 79.5 |
| Information | 1 | 16.7 | 74.2 | 7 | 70.0 | 87.8 |
| Personal | 0 | 0.0 | 68.7 | 1 | 10.0 | 83.8 |
| Management | 2 | 33.3 | 70.8 | 0 | 0.0 | 60.8 |
| Consequence | 0 | 0.0 | 58.5 | 0 | 0.0 | 50.4 |
| Collaboration | 2 | 33.3 | 66.3 | 0 | 0.0 | 60.8 |
| Refocusing | 0 | 0.0 | 54.8 | 0 | 0.0 | 67.3 |

Table 8

SOC Profiles of Rogers February 1988 and Rogers May 1990

| | February 1988 | | | May 1990 | | |
|---|---|---|---|---|---|---|
| SOC Level | n | % | Profile | n | % | Profile |
| Awareness | 0 | 0.0 | 73.5 | 5 | 12.5 | 74.2 |
| Information | 10 | 66.7 | 91.2 | 18 | 45.0 | 85.2 |
| Personal | 5 | 33.3 | 88.2 | 8 | 20.0 | 84.1 |
| Management | 0 | 0.0 | 57.6 | 7 | 17.5 | 67.9 |
| Consequence | 0 | 0.0 | 46.5 | 0 | 0.0 | 55.6 |
| Collaboration | 0 | 0.0 | 69.9 | 2 | 5.0 | 67.9 |
| Refocusing | 0 | 0.0 | 54.0 | 0 | 0.0 | 65.3 |

Figure 1. Stages of Concern Profile of the Total Sample.

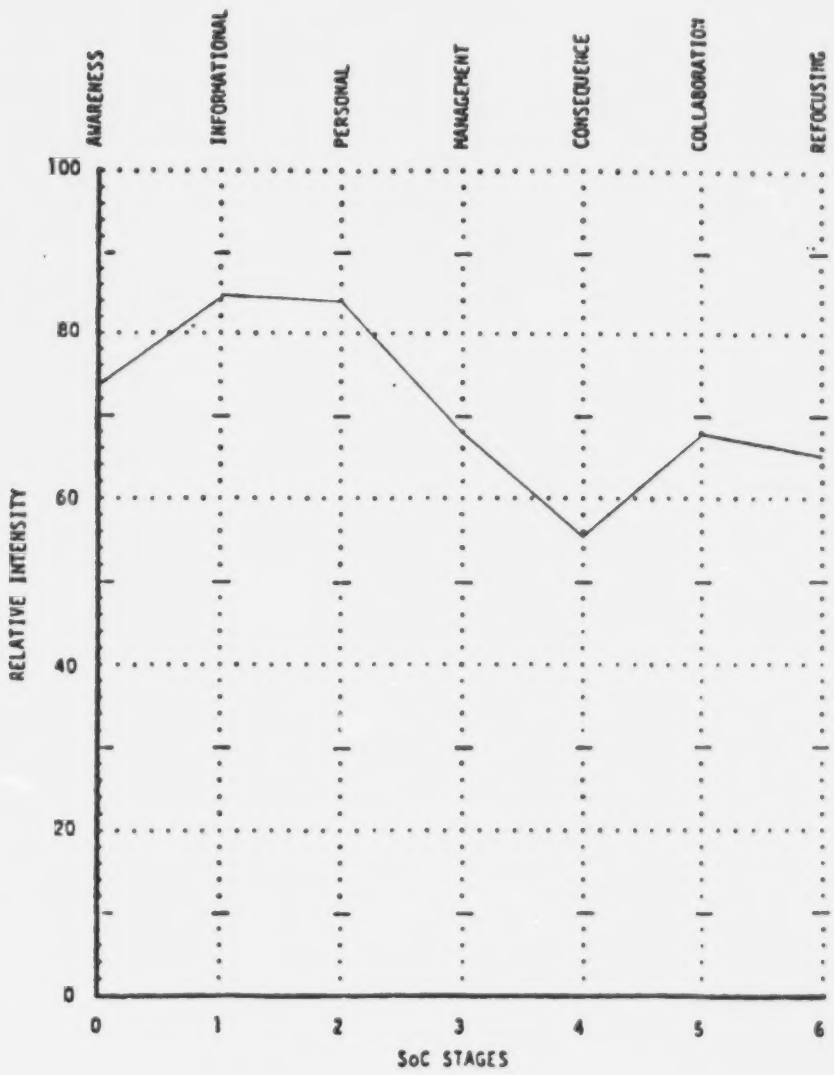
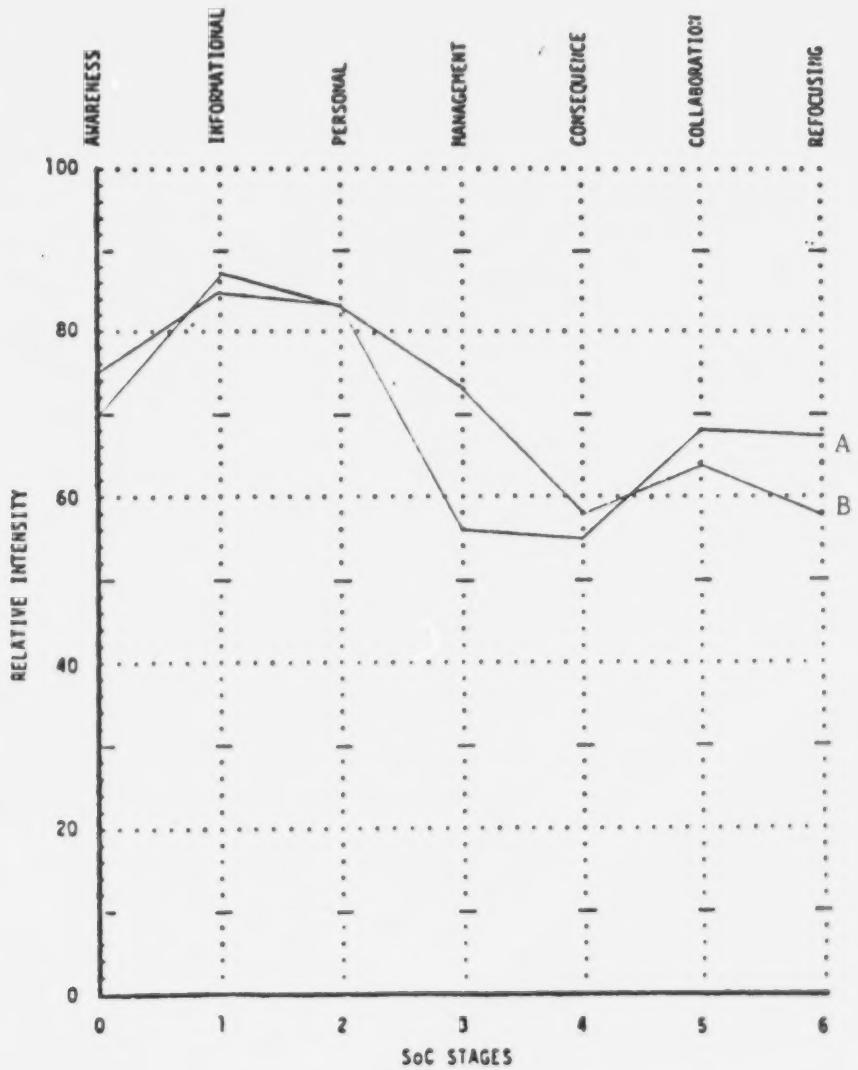
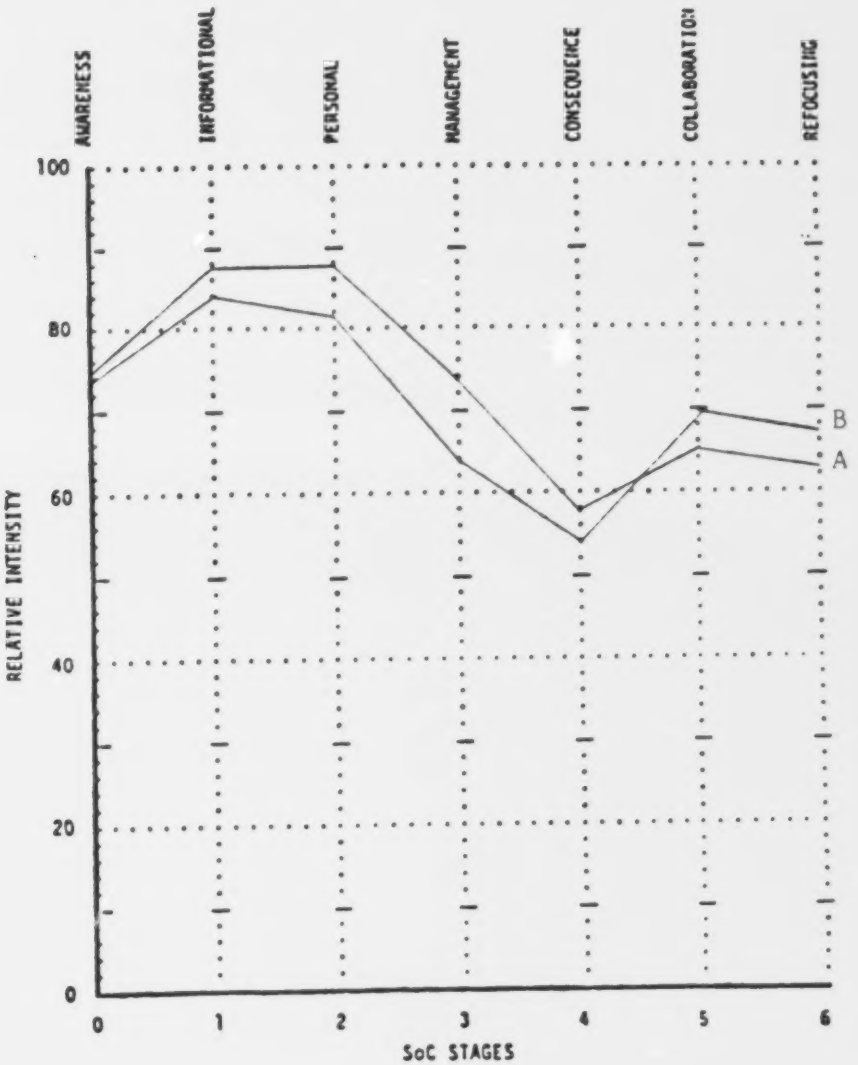


Figure 2. Stages of Concern Profiles of Omaha Public Schools' (OPS) and Millard Public Schools' (MPS) Industrial Arts Teachers.



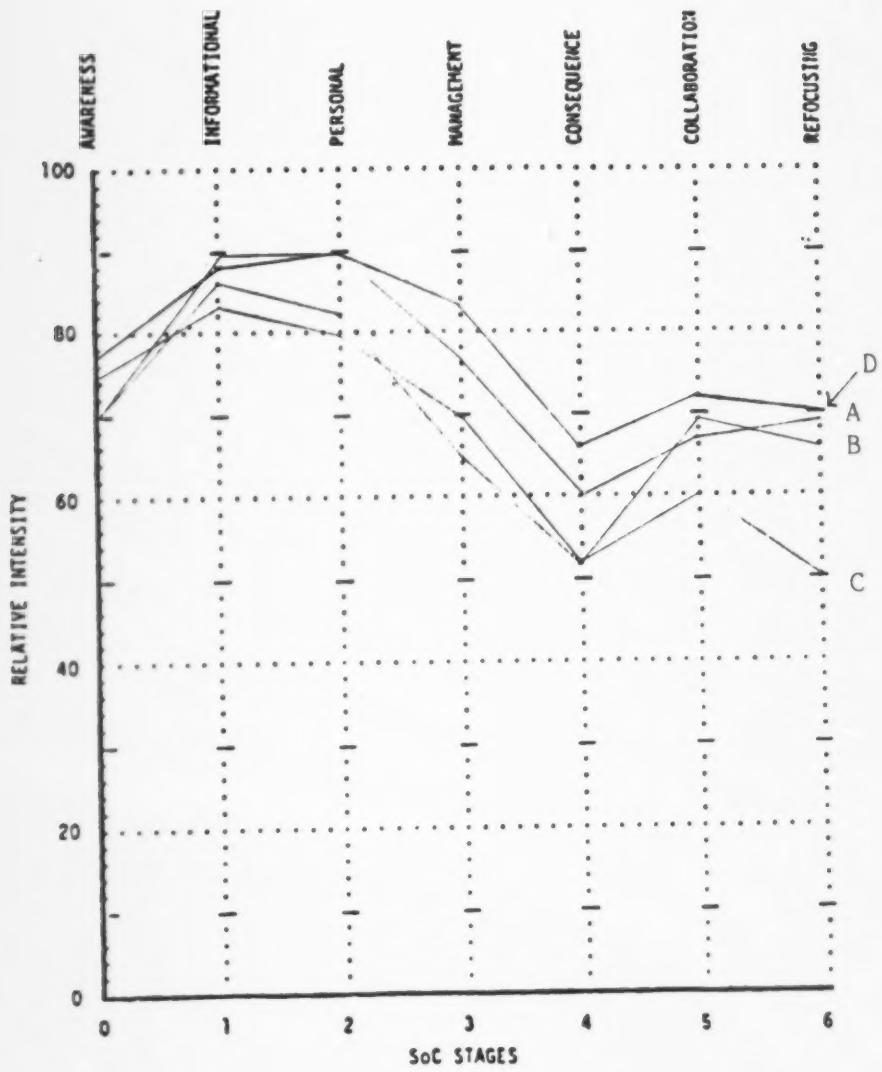

A = OPS Industrial Arts Teachers
B = MPS Industrial Arts Teachers

Figure 3. Stages of Concern Profiles of Junior High/Middle School (JHS/MS) and Senior High School (SHS) Industrial Arts Teachers.



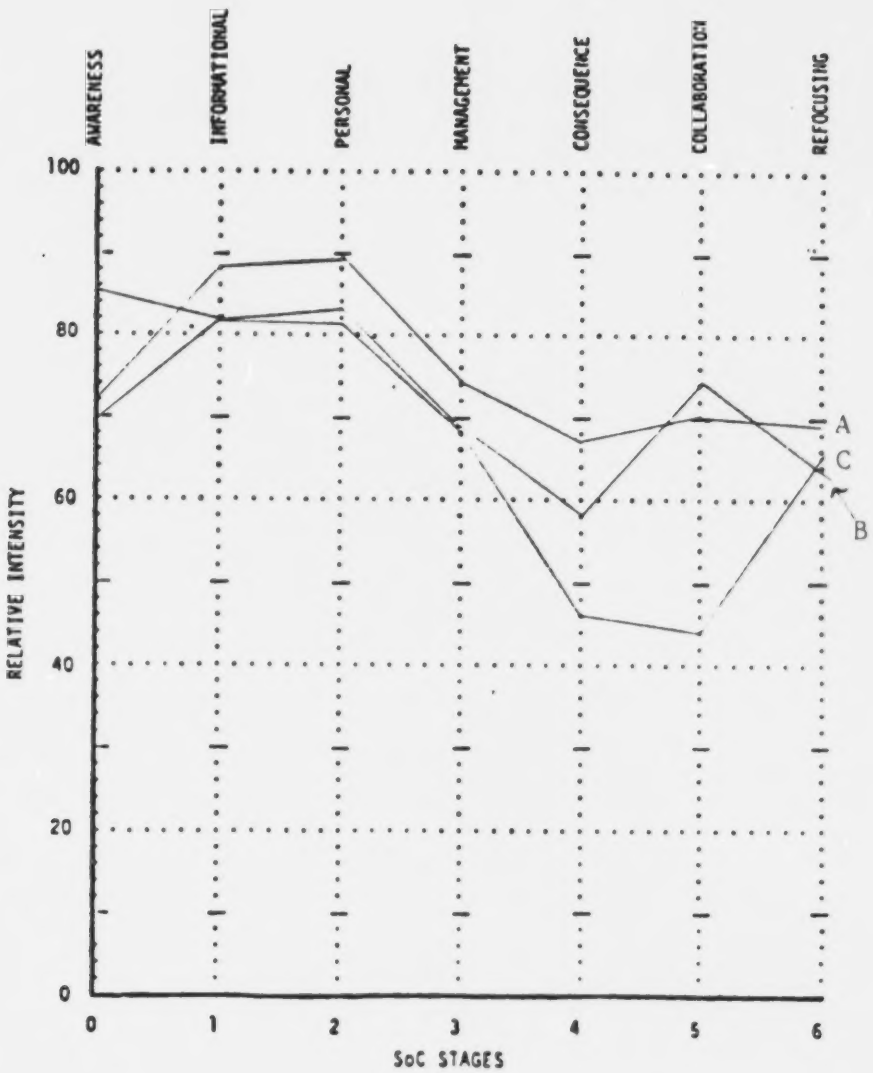

A = JHS/MS Industrial Arts Teachers
B = SHS Industrial Arts Teachers

Figure 4. Stages of Concern Profiles of Both OPS and MPS JHS/MS and SHS Industrial Arts Teachers.



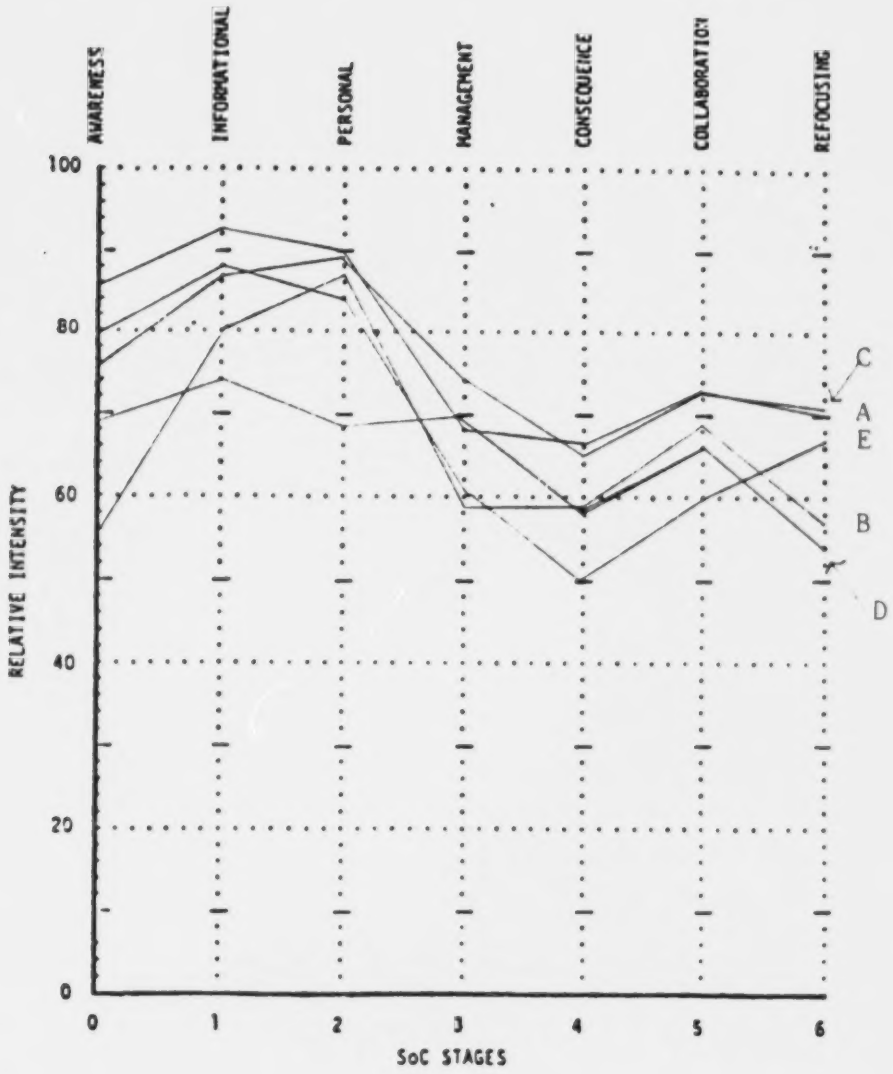

A = OPS JHS/MS Industrial Arts Teachers
B = OPS SHS Industrial Arts Teachers
C = MPS JHS/MS Industrial Arts Teachers
D = MPS SHS Industrial Arts Teachers

Figure 5. Stages of Concern Profiles of Industrial Arts Teachers by Age Group.



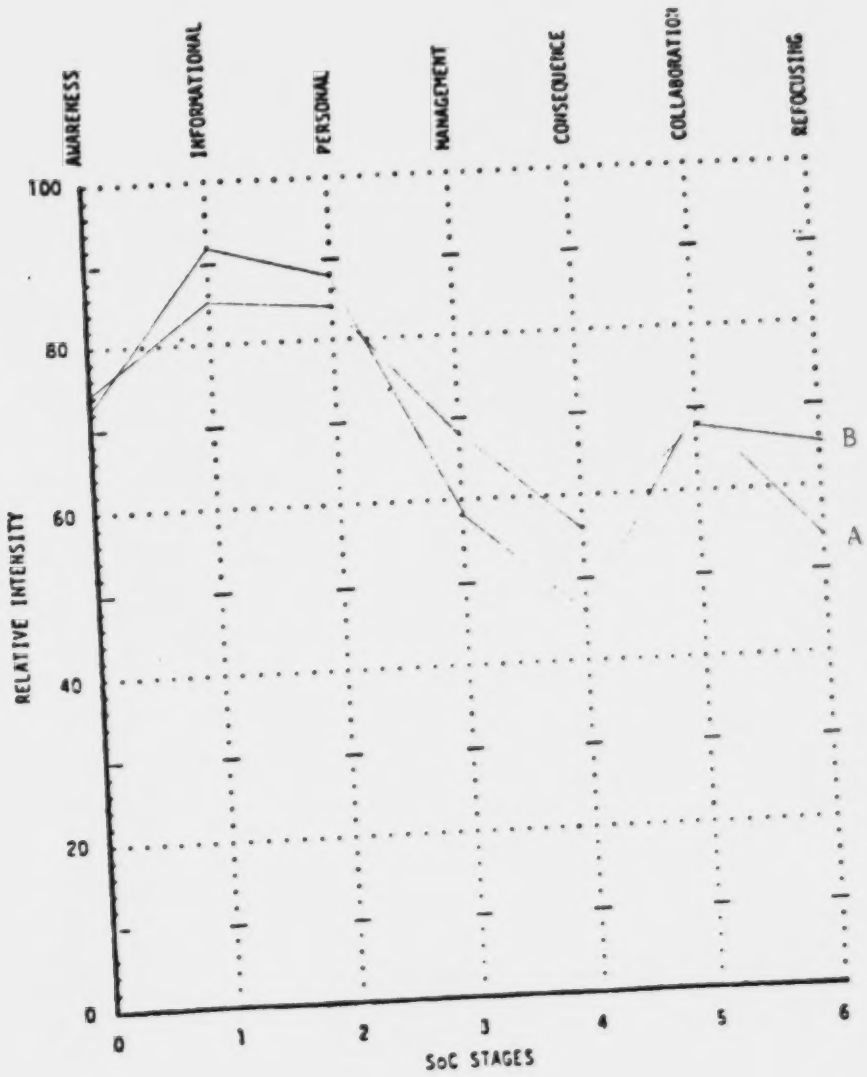

A = 20-40 Years Old
B = 41-50 Years Old
C = 51 Years Old and Over

Figure 6. Stages of Concern Profiles of Industrial Arts Teachers by Years of Teaching Experience.




A = 0-10 Years of Teaching Experience
B = 11-15 Years of Teaching Experience
C = 16-20 Years of Teaching Experience
D = 21-26 Years of Teaching Experience
E = 26 or More Years of Teaching Experience

Figure 7. Stages of Concern Profiles of Rogers February 1988 Research and Rogers May 1990 Research.




A = February 1988
B = May 1990